REMARKS

Claim Rejections Under 35 U.S.C. §103(a)

Claims 1-12, 14-15 and 45-51 were rejected for obviousness pursuant to 35 U.S.C. §103(a). Additionally, claims16-19, 21-26, 28-33, 35-41, 43 and 44 are further rejected under 35 U.S.C §103 (a) as being unpatentable over Agrawal in view of Manchester and further in view of Fukushima et al. (U.S. Patent No 6,205,562, hereinafter Fukushima). For the reasons set forth below, Applicant respectfully traverses these rejections.

Summary of Claimed Invention

The present invention is related to circuit failure/restoration in a timely manner, such that communication with a diversely routed circuit in a mesh network is not interrupted. To accomplish such network communication, triggers are used within the network. A trigger is sent through the network at the time of a path failure. Upon reception of a trigger, indicative of a path failure, the network pathway is switched from a first interrupted path to a second functional path. The triggers prompt, at least partially, the switching step, and restore the circuit to a functional mode. The triggers, according to further aspects of the present invention, can take many different forms, including path AIS messages, path RDI messages, LDP messages, and path Unequipped messages for signaling path failures.

Independent claim 1 (and claims 2-6 which are dependent thereon) is directed to methods for restoring a diversely routed circuit in a mesh network. Independent claim 1 recites the steps of receiving one or more triggers at a destination node and a source node wherein these triggers indicate a path failure in the mesh network. Additionally, the reception of a trigger, at least partially, results in the switching from a first path to a second path such that the circuit is restored while the first path is subsequently returned to a functional path.

Summary of Agrawal

Agrawal recites a method for addressing node failures with a service path in a network or within a restoration path in an optical network. The method by which failures are addressed is dependent upon at which element within the service path or restoration path the failure occurs. Under Agrawal, each node in the network from start node to end node is first provided with a database detailing all potential service paths and restoration paths. A distributed network operating system (DNOS) is initialized at each node in the network such that a separate thread for each demand relating to all aspects of network management. During system initialization, the DNOS of each node retrieves the predetermined restoration paths that may be used in the event of a node failure. Furthermore, data relating to links and wavelengths that are available is further retrieved. The data retrieved for each node will differ depending upon the nodes location within the network. For example, start and end nodes will operated differently than intermediate nodes in the vent of a service path failure. Having loaded the predetermined restoration paths within the various nodes of the network, upon the determination of a failure within the service path, nodes with the network are notified of the service path failure. The notification of nodes within the network will differ based upon what types of node fails. For example, if the node is an intermediate node of the service path, the node transmits a failure message to its next node along the service path. If the node is the end node of the service path, the node transmits a restore message to its previous node along the restoration path. Furthermore, if the node is an intermediate node of the restoration path the node transmits a restore message to its previous node along the restoration path.

Summary of Manchester

The cited Manchester reference recites the use of protection bundles (PB) to aid in switching from an initial pathway for signal transfer within the network to a predefined Common Protection Route (CPR). Manchester recites that the protection bundle (PB) is defined by all working signals sharing identical protection facilities. As defined by Manchester, a Bundle Protection Fragment (BPF) are the working facilities traversed by a PB. The end-points of the BPF (i.e the start and end nodes of the network) can exchange protocol messages along the protection facilities when necessary. Additionally, the protection facilities orientated

between the end-points of a BPF serve to define the end-points for a Common Protection Route (CPR). Upon detection of a failure within the network, each affected PB can be switched from its BPF to its CPR wherein all signals assigned to the PB are switched simultaneously.

Argument

The combination of Agrawal in view of Manchester cited by the Examiner fails to teach or suggest all of the limitations of independent claim 1. Specifically, neither Agrawal or Manchester discusses the use of a trigger mechanisms as used in the present invention, wherein said trigger mechanism is received at one of a destination node and a source node of a first path such that the trigger is indicative of a path failure. Applicants respectfully submit that the Examiner has noted that the Agrawal art fails to teach or suggest the use of a trigger mechanism as disclosed in the present invention. In reference to the cited language of Agrawal, namely column 2 lines 12-26 and column 10, lines 20-29, Applicants submit that the cited language fails to teach or suggest the use of a trigger that is received at one of a destination node and a source node of the first path (i.e the service path) wherein it is this trigger that prompts the switch to a second path (i.e restoration path) in the network. Applicant submit that the cited language, in contrast, details the transmission of an error message across various nodes within the network based upon a variety of node types. For example, intermediate nodes will transmit an error message to neighboring nodes along the service path, while end nodes transmit an error message to the previous node within the restoration pathway. Applicants respectfully such an arrangement does not teach or suggest that which is claimed in pending independent claim 1 of the present invention.

Furthermore, Applicants submit that the cited Manchester art fails to teach or suggest the receiving of a trigger at one of a *destination node and a source node* as set forth in pending independent claim 1 of the present invention. As set forth at column 4, lines 42-57 of Manchester, the process by which a PB is switched from the BPF to the CPR includes the steps of:

1. the node receives a trigger indicating that another node has detected a failure;
2. when the trigger is received, the node determines whether or not it is associated with a

protection bundle; if not, there are no signals to restore and the process ends;

3. if the node is associated with a protection bundle, the node determines whether or not it terminates a BPF;

4. if the node terminates a BPF, the PB is switched from the working facility BPF's to protection facility CPR's and a coordination mechanism is initiated, if necessary;

5. if the node is not the termination of the BPF specified by the trigger, the node forwards the trigger mechanism to the end points of the through BPFs;

6. the signals are restored and the process ends.

As recited in Manchester, the switching from a BPF to a CPR (i.e the switching from a first path to a functional second path) only occurs following the receipt of a trigger in a node that is associated with a predetermined protection bundle (PB) as set forth in step 2. If there is not an associated protection bundle, the trigger signal is not passed any further. In contrast, the present invention teaches the delivery of triggers to source and destination nodes associated with a mesh network wherein these nodes are not required to be associated with a predefined protection bundle.

Furthermore, in accordance with step 5 of the cited Manchester reference, if the node is not the termination of the BPF the node forwards the trigger mechanism to the *end points* of the BPF. Such notification of end points alone is detailed at column 8, line 63 to column 9, line 4, which read in part:

> "A trigger mechanism alerts downstream nodes for the need to initiate protection switching where the node detecting the failure is not the terminating node for one or more BPFs. That is, if BPFs pass through a node detecting a failure, a trigger mechanism is used to notify the *end-points* of the BPFs passing through the node. In FIG. 5C, for example, node D detects a failure on the CD link 550 and sends a trigger to nodes F and H, which are the end nodes for BPF CF and BPF CH, respectively."

Applicants respectfully submit that the cited art to Manchester fails to teach or suggest the receiving of one or more triggers at *one of a destination node and a source node* of a first path as recited in pending claims 1. In light of this, Applicants submit that the cited combination

of Agrawal in view of Manchester fails to render pending independent claim 1, and dependent claims 2-6 obvious. In light of this, Applicants urge the Examiner to pass claims 1-6 to allowance.

Regarding the Examiners rejection of dependent claims 7-12 and 14-15, Applicants further submit that said claims are not rendered obvious in view of the cited art. Firstly, Applicants submit that claims 7-12 and 14-15 are in condition for allowance by their very nature as dependent claims which rely on an independent claim that is in condition for allowance. Applicants further submit that the sending of a trigger, as set forth in pending claim 7 of the present invention, in a first and second direction along both a first and second path is neither taught nor suggested by the cited art. Additionally, the sending of LDP, AIS or Unequipped messages for signaling a path failure condition, as recited in pending dependent claims 8, 9 and 10, is additionally neither taught nor suggested by the cited art to Agrawal and Manchester. In light of such arguments, Applicants respectfully request that the Examiner withdraw the rejection directed toward claims 7-12 and 14-15 and pass said claims to allowance.

Claims 16-19, 21-26, 28-33, 35-41, 43 and 44 are further rejected under 35 U.S.C 103 (a) as being unpatentable over Agrawal in view of Manchester and further in view of Fukushima *et al.* (U.S. Patent No 6,205,562, hereinafter Fukushima)

Summary of Fukushima

Fukushima discloses a uni-direction protection switched ring node capable of switching from a working path to a protection path upon the detection of a failure in the path by a failure-information detect circuit. This failure-information-path is capable of identifying if the working path that has a failure, or the protection path that experiences a failure, is either an active or standby path. A select circuit selects either the working or protection path as an active path in accordance with results of detection and determination by the failure-information detect circuit and the failure-information-path identifying circuit respectively.

Argument

The Examiner has rejected the aforementioned claims in view of Agrawal in view of Manchester and further in view of Fukushima. Applicants submit that, as set forth prior, the Agrawal and Manchester references fail to teach or suggest the reception of a trigger *at a destination node and a source node* in accordance with independent claims 16, 23, and 37 of the pending application. Applicants further submit that the Fukushima reference further fails to teach or suggest such reception of a trigger at a destination node and a source node. In contrast, the Fukushima art recites the existence of a failure-information detect circuit, as opposed to the trigger of the present invention, wherein said circuit is used in actively detecting a failure in one path of the ring network of Fukushima.

In view of this, and the arguments set forth prior, Applicants respectfully submit that the cited references, alone or in combination, fail to teach or suggest each element of the pending application.

Furthermore, applicants additionally submits that the cited Fukushima art fails to teach or suggest the bi-direction, or uni-directional failure within a *mesh network* as set forth in independent claims 16, 23 and 37, but rather recites the use of a failure-information detect circuit within a ring network arrangement.

Applicants additionally submit that dependent claims 17-19, 21-22, 24-26, 28-33, 35-36, 37-41, 43 and 44 are further in condition as they are dependent claims which serve to further limit the scope of the independent claims on which they rely. In light of this, Applicants request that the Examiner withdraw the rejection to claims 16-19, 21-26, 28-33, 35-41, 43 and 44 and pass said claims to allowance.

Additionally, in view of the aforementioned arguments related to independent claims 1, 16, 23 and 37, Applicants submit that claims 13, 20, 27, 34 and 42, which are noted by the Examiner to be allowable but for the fact that the rely on independent claims which were

rejected, are now in condition for allowance. Applicants therefore request that the Examiner pass these claims to allowance in their current form.

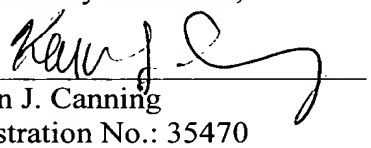
CONCLUSION

In view of the above, each of the presently pending claims in this application are believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes no fee is due with this statement. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. SMQ-059 from which the undersigned is authorized to draw.

Dated: January 28, 2004

Respectfully submitted,

By 

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